

# Technology Opportunity

## Microscopic Subsurface Flaw Characterization System (Scanning Electron Acoustic Microscopy - SEAM)

A modification to the conventional scanning electron microscope (SEM) has been developed. The modified microscope is called the scanning electron acoustic microscope (SEAM). Unlike the SEM, which restricts examination to specimen surfaces, SEAM permits examination of subsurface flaws, defects, and residual stress fields.

### The Benefits

- Nondestructive assessment of subsurface flaws
- Displays residual stress field of material
- Adaptable to irregular shapes of test object
- Add-on to existing scanning electron microscope

### Potential Commercial Uses

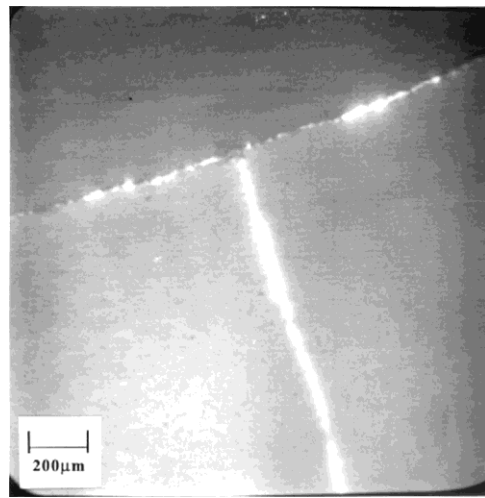
- Materials Process Monitoring: metals, ceramics, semiconductors, crystal growth
- Fabrication Technology: microcircuits, advanced composites, electronic components
- Components Manufacturing: ball bearings, optical components, machine components

### The Technology

The modulation (or chopping) of an electron beam striking a specimen surface generates acoustic waves in the specimen. The strength of the acoustic waves depends upon the thermal and mechanical properties of a volume of specimen beneath the point on the surface at which the electron beam strikes. The acoustic waves propagate through the specimen and are



SEM



SEAM ( $f = 305.43 \text{ kHz}$ )

